Abstracts

Nonreciprocal Reflection-Beam Isolators for Far-Infrared Use

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Magnetoplasma reflection-beam isolators for submillimeter-wave use are discussed in theory and experiment. The basic device uses the Kerr transverse magnetooptic effect (plane of polarization of the EM wave in the plane of incidence, which is perpendicular to a dc magnetic field) in InSb near room temperature. When the semiconductor slab is covered with a thin dielectric layer acting as a matching transformer, improved performance is predicted and observed at 337 µm, and very efficient isolator performance is predicted for 118 µm. Physical arguments are presented to explain the nonreciprocal phenomenon and lead to better device design.

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